

**IN THE DRAWINGS:**

Attached is a Submission of Replacement Drawing Sheets including a change to Fig. 15. These Replacement Drawing Sheets, which include all of Figs. 1-18 in this application, replace the previously-filed drawing sheets. In these Replacement Drawing Sheets, Fig. 15 has been amended to replace reference numeral "450" with --440-- in response to the objection to the drawings in the Office Action and consistent with the Examiner's helpful suggested revision.

**REMARKS**

**Summary of the Office Action**

The drawings are objected to because of an allegedly incorrect reference number.

The disclosure is objected to because of alleged informalities in the specification.

Claims 1 and 7 are objected to because of alleged informalities.

Claim 7 stands rejected under 35 U.S.C. § 112, second paragraph, as allegedly having insufficient antecedent basis for a feature of the claim.

Claims 1, 2 and 6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bernacki (U.S. Patent No. 4,119,855) (hereinafter "Bernacki").

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Karnezos et al. (U.S. Patent No. 4,632,871) (hereinafter "Karnezos").

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as modified by Karnezos as applied to claim 3 above, and further in view of Suzuki et al. (U.S. Patent No. 5,161,179) (hereinafter "Suzuki").

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Ukita (U.S. Patent Publication No. 2003/0185344) (hereinafter "Ukita").

Claims 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Nishikawa (U.S. Patent No. 5,039,203 (hereinafter "Nishikawa").

**Summary of the Response to the Office Action**

Applicants have amended paragraph [0002] of the specification to improve its form. Claim 1 has been amended to differently describe embodiments of the disclosure of the instant application by including features of previous dependent claim 3. Accordingly, claim 3, as well as claim 2, have been canceled without prejudice or disclaimer. In addition, new independent claims 11 and 12 have been presented to differently describe embodiments of the disclosure of the instant application. The dependencies of previous dependent claims 4-9 have been amended so as to now be dependent on newly-added independent claim 11. Also, new dependent claims 10 and 13-20 have been added. Accordingly, claims 1 and 4-20 are currently pending for consideration. A Submission of Replacement Drawing Sheets is attached including a change to Fig. 15.

**Objection to the Drawings**

The drawings are objected to because of an allegedly incorrect reference number in Fig. 15. In a Submission of Replacement Drawing Sheets attached hereto, Fig. 15 has been amended to replace reference numeral "450" with --440-- in response to the objection to the drawings in the Office Action and consistent with the Examiner's helpful suggested revision provided at page 2 of the Office Action. Accordingly, Applicants respectfully request that the objection to the drawings be withdrawn.

**Objection to the Disclosure**

The disclosure is objected to because of alleged informalities in the specification.

Applicants have amended paragraph [0002] of the specification to improve its form in response to the objection to the disclosure in the Office Action and consistent with the Examiner's helpful suggested revisions provided at page 2 of the Office Action. Accordingly, Applicants respectfully requests that the objection to the disclosure be withdrawn.

**Objection to the Claims**

Claims 1 and 7 are objected to because of alleged informalities. Applicants have amended claim 1 to improve its form in response to the objection in the Office Action and consistent with the Examiner's helpful suggested revision provided at page 3 of the Office Action. It appears that the Office Action's reference to claim "7" in this regard was intended to be directed to claim --9-- because claim 7 does not include the "through-holes each" language referred to by the Office Action. Accordingly, Applicants have amended claim 9 to improve its form in response to the objection in the Office Action and consistent with the Examiner's helpful suggested revision provided at page 3 of the Office Action. To the extent that Applicants' understanding is incorrect with regard to claims 7 and 9, the Examiner is requested to provided clarification in the next Office Communication. Accordingly, Applicants respectfully request that the objections to the claims be withdrawn.

**Rejection under 35 U.S.C. § 112, second paragraph**

Claim 7 stands rejected under 35 U.S.C. § 112, second paragraph, as allegedly having insufficient antecedent basis for a feature of the claim. Applicants have amended claim 7 in response to the Examiner's comments at page 3 of the Office Action. Applicants respectfully submit that claim 7, as amended, fully complies with the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph be withdrawn.

**Rejections under 35 U.S.C. §§ 102(b) and 103(a)**

Claims 1, 2 and 6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bernacki. Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Karnezos. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as modified by Karnezos as applied to claim 3 above, and further in view of Suzuki. Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Ukita. Claims 8 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bernacki as applied to claim 1 above and further in view of Nishikawa.

Claim 1 has been amended to differently describe embodiments of the disclosure of the instant application by including features of previous dependent claim 3. Accordingly, claim 3, as well as claim 2, have been canceled without prejudice or disclaimer. In addition, new independent claims 11 and 12 have been presented to differently describe embodiments of the disclosure of the instant application, as will be discussed further in the following remarks. The

dependencies of previous dependent claims 4-9 have been amended so as to now be dependent on newly-added independent claim 11. Also, new dependent claims 10 and 13-20 have been added. Accordingly, to the extent that these rejections might be deemed to still apply to remaining claims 1 and 4-20 in their current form, the rejections are respectfully traversed for at least the following reasons.

The X-ray tube as described in newly-amended independent claim 1 is supported, for example, by the third to fifth embodiments of the instant application using a glass face plate. See, for example, Figs. 10, 15 and 16 of the instant application. Applicants respectfully submit that in the case that the entire closed vessel is comprised of a glass material, the claimed glass face plate corresponds to the top portion of the closed vessel. See, for example, Fig. 15 of the instant application. In the case that the closed vessel and the glass faceplate are separated from each other, Applicants respectfully submit that the glass plate constitutes a part of the closed vessel by a metal flange supporting the glass faceplate. See, for examples, Figs. 10 and 16 of the instant application.

Applicants respectfully submit that newly-added independent claim 11 is directed to an X-ray tube having a protection electrode (for example, Figs. 10, 15 and 16 of the instant application), however, the features concerning the material of the glass faceplate and the anode bonding are omitted from the new claim 11. In the configuration that the silicon foil is affixed on the glass faceplate, Applicants respectfully submit that the protection electrode functions to prevent the electrification of the inner surface of the glass faceplate.

On the other hand, Applicants respectfully submit that newly-added independent claim 12 is basically similar to newly-amended independent claim 1 of the instant application without the

features concerning the material of the glass faceplate and the anode bonding and is characterized by a metal flange. See, for example, Figs. 10 and 16 of the instant application. Applicants respectfully submit that the dependent claims 13 and 14 are supported by the third and fifth embodiments, for example, of the instant application's disclosure.

In order to clearly distinguish the claimed combinations of X-ray features from the applied Bernacki reference, Applicants respectfully submit that the claimed closed arrangement is defined such that it is constituted by the glass main body, the metal flange and the glass faceplate. Applicants respectfully submit that, in such a configuration, the metal flange can function as a part of a protection electrode.

Applicants respectfully submit that the advantageous combination of features of an X-ray tube in independent claim 11 of the instant application includes a protection electrode provided on the inner surface of the glass faceplate which is directly exposed as viewing from the inside of the closed vessel to the glass faceplate. The protection electrode functions to prevent the electrification on the inner surface of the glass face plate. Applicants respectfully submit that it is clear that the applied Bernacki and Karnezos references, whether taken separately or in combination together, do not teach, or even suggest, these features.

Applicants respectfully submit that the advantageous combination of features of an X-ray tube in independent claim 12 of the instant application includes a metal flange and a glass faceplate, and is characterized by the material combination of the main body and the metal flange and by the material combination of the metal flange and the glass faceplate. Applicants respectfully submit that in this configuration, even if the Examiner was to indicate the portion provided with the window 24 as a flange, the applied Bernacki and Karnezos references, whether

taken separately or in combination together, do not teach, or even suggest, such a material combination.

Also, Applicants respectfully submit that the combination of features of an X-ray tube, as respectively described in independent claims 1, 11 and 12 of the instant application, is characterized by a glass faceplate and a silicon foil directly affixed on the glass faceplate. Applicants respectfully submit that, in the Office Action, the Examiner asserts that the silicon foil is directly affixed on a part of the closed vessel, but such a specific feature cannot be confirmed from the figures or from the description of Bernacki. Applicants respectfully submit that there is a case in which the temperature of an X-ray transmission window and the neighborhood thereof becomes high by the crash of the electrons traveling toward the target in a transmission type X-ray tube or the reflected electrons from the target in a reflection type X-ray tube. In this case, Applicants respectfully submit that there is a possibility that the silicon foil breaks because of the expansion coefficient difference between the closed vessel and the silicon foil. To prevent such a problem, in the claimed X-ray tube combinations of the instant application, the silicon foil is directly affixed on the glass faceplate. Applicants respectfully submit that since the expansion coefficient of the silicon foil and that of the glass faceplate are substantially the same, the break of the silicon foil can be prevented even if the temperature of the closed vessel itself becomes high. Applicants respectfully submit that the claimed X-ray tube, defined by such a configuration, can advantageously reduce a possibility of the silicon foil breaking.

Accordingly, Applicants respectfully assert that the rejections under 35 U.S.C. §§ 102(b) and 103(a) should be withdrawn because neither of Bernacki nor Karnezos, whether taken singly



or combined, teach or suggest each feature of independent claims 1, 11 and 12 of the instant application. As pointed out in MPEP § 2131, "[t]o anticipate a claim, the reference must teach every element of the claim." Thus, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. Of California*, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987)." Similarly, MPEP § 2143.03 instructs that "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

Furthermore, Applicants respectfully assert that the dependent claims are allowable at least because of their dependence from claims 1, 11 or 12, and the reasons set forth above.

Finally, Applicants respectfully submit that the additionally-applied references to Suzuki, Ukita and Nishikawa do not cure the deficiencies of Bernacki and Karnezos, as discussed previously.

### **CONCLUSION**

In view of the foregoing, Applicants submit that the pending claims are in condition for allowance, and respectfully request withdrawal of all outstanding objections and rejection, and request the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution. A favorable action is awaited.

**EXCEPT** for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required, including

any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573.

This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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